

WHAT IS CLAIMED IS:

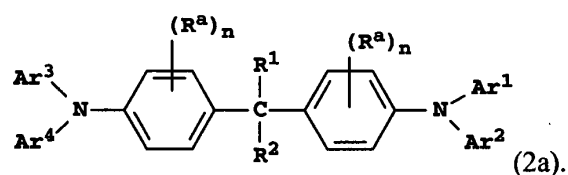
1. An electroluminescent device comprising a cathode and an anode and, located therebetween, a light-emitting layer (LEL) comprising a phosphorescent guest material, a hole- and electron-transporting host material, and an efficiency-enhancing material having an ionization potential lower than that of the host material and a triplet energy level that is lower than that of the phosphorescent guest material by no more than 0.2 eV.
2. The device of claim 1 wherein the efficiency-enhancing material has a triplet energy level that is higher than that of the phosphorescent guest material.
3. The device of claim 1 wherein the efficiency-enhancing material is not emissive.
4. The device of claim 1 wherein the phosphorescent guest material emits green light.
5. The device of claim 1 wherein the phosphorescent guest material emits red light.
6. The device of claim 1 wherein the phosphorescent guest material is an organometallic compound comprising a 5th-row transition metal.
7. The device of claim 1 wherein the metal is iridium or platinum.

8. The device of claim 1 wherein the organometallic compound includes a ligand that can be coordinated to a metal through an sp^2 carbon and a heteroatom.
9. The device of claim 8 wherein the ligand is a phenylpyridine group.
10. The device of claim 6 wherein the organometallic compound is chosen from tris(2-phenylpyridinato- $N,C^{2'}$)iridium(III)), bis(2-phenylpyridinato- $N,C^{2'}$)iridium(III)(acetylacetonate), bis(2-phenylpyridinato- $N,C^{2'}$)platinum(II), tris(2-phenylquinolinato- $N,C^{2'}$) iridium(III), tris(1-phenylisoquinolinato- $N,C^{2'}$)iridium(III), and tris(3-phenylisoquinolinato- $N,C^{2'}$)iridium(III) groups.
11. The device of claim 1 wherein the efficiency-enhancing material is present at a concentration of 1 to 30% by weight of the light-emitting layer.
12. The device of claim 1 wherein the efficiency-enhancing material is present at a concentration of 3 to 10% by weight of the light-emitting layer.
13. The device of claim 1 wherein the phosphorescent guest material is present at a concentration of 1 to 20% by weight of the light-emitting layer.
14. The device of claim 1 wherein the phosphorescent guest material is present at a concentration of 3 to 10% by weight of the light-emitting layer.

15. The device of claim 1 wherein the efficiency-enhancing material is a tertiary aromatic amine.

16. The device of claim 15 wherein the efficiency-enhancing material includes two or more triarylamine groups linked together by a linking group.

17. The device of claim 1 wherein the efficiency-enhancing material is a compound represented by Formula (2a),



wherein:

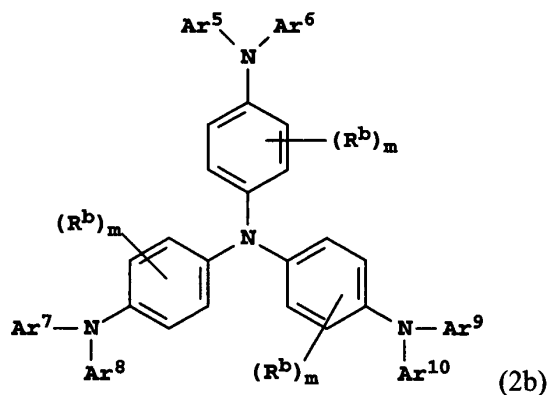
R^1 and R^2 represent hydrogen or substituents, provided R^1 and R^2 can join to form a ring;

Ar^1 - Ar^4 represent independently selected aromatic groups;

each R^a independently represents hydrogen or an independently selected substituent; and

each n is independently selected as 0-4.

18. The device of claim 1 wherein the efficiency-enhancing material is a compound represented by Formula (2b),



wherein:

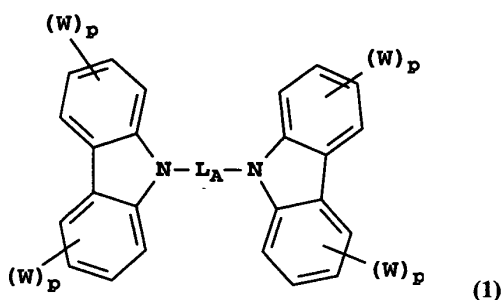
- Ar⁵-Ar¹⁰ independently represent aromatic groups;
- each R^b independently represents an independently selected substituent;
- and
- each m is independently selected as 0-4.

19. The device of claim 1 wherein the efficiency-enhancing material is chosen from:

- 1,1-Bis(4-di-*p*-tolylaminophenyl)cyclohexane;
- 1,1-Bis(4-di-*p*-tolylaminophenyl)-4-phenylcyclohexane;
- 1,1-Bis(4-di-*p*-tolylaminophenyl)-4-methylcyclohexane;
- 1,1-Bis(4-di-*p*-tolylaminophenyl)-3-phenylpropane;
- 4,4',4''-Tris(diphenylamino)triphenylamine;
- 4,4',4''-Tris[(3-methylphenyl)phenylamino]triphenylamine;
- Bis[4-(N,N-diethylamino)-2-methylphenyl](4-methylphenyl)methane;
- Bis[4-(N,N-diethylamino)-2-methylphenyl](4-methylphenyl)ethane;
- 4-(4-Diethylaminophenyl)triphenylmethane; and
- 4,4'-Bis(4-diethylaminophenyl)diphenylmethane.

20. The device of claim 1 wherein the host material comprises a compound selected from arylamine, triazole, indole, and carbazole group containing compounds.

21. The device of claim 1 wherein the host material comprises a carbazole represented by Formula 1:



wherein:

W independently represents hydrogen or an independently selected substituent, p independently is 0-4, and L_A represents a linking group.

22. The device of claim 1 wherein the host material comprises one selected from 4,4'-N,N'-dicarbazole-biphenyl, 4,4'-N,N'-dicarbazole-2,2'-dimethyl-biphenyl, 1,3-bis(N,N'-dicarbazole)benzene, and poly(N-vinylcarbazole) group containing compounds.

23. The device of claim 1 that comprises two or more host materials.

24. The device of claim 1 including a means for emitting white light.

25. The device of claim 24 including two or more compounds capable of emitting complimentary colors.

26. The device of claim 24 including a compound capable of emitting white light.
27. The device of claim 24 including a filtering means.
28. A display comprising the electroluminescent device of claim 1.
29. An area lighting device comprising the electroluminescent device of claim 1.
30. A process for emitting light comprising applying a potential across the device of claim 1.